

WHAT IS CLAIMED IS:

1. A method for controlling uplink transmission power in a handover region by a UE (User Equipment) in communication with a Node B using an FCS (Fast Cell Selection) scheme, comprising the steps of:

storing TPC (Transmission Power Control) commands received for a specific duration from a plurality of cells in an active set, if the UE enters the handover region during communication with a current best cell;

- determining, when a next best cell is selected from the plurality of the cells, a transmission power offset by comparing TPC commands from the current best cell with TPC commands from the next best cell for the specific duration at a point in time where the best cell is changed from the current best cell to the next best cell; and

transmitting initial transmission power for the next best cell at a transmission power level determined considering the transmission power offset.

15

2. The method as claimed in claim 1, wherein the transmission power offset is calculated by

$$P_{offset} = 2 \times \sum_{duration_1} (UE_{down})$$

- for the duration from a point in time where the best cell is changed until a time slot just next a time slot indicating that the TPC command indicates a power-down command,

where P_{offset} represents the transmission power offset, $duration_1$ represents the specific duration, and UE_{down} represents a number of power-down commands among the TPC commands transmitted by the current best cell during the specific duration.

25

3. The method as claimed in claim 1, wherein the specific duration is a duration of a predetermined number of time slots of the next best cell from a point in time where the best cell is changed from the current best cell to the next best cell.

4. The method as claimed in claim 1, wherein the transmission power offset is calculated by

$$P_{\text{offset}} = \sum_{\text{duration}_2} (UTRAN_{\text{up}} - UTRAN_{\text{down}} - (UE_{\text{up}} - UE_{\text{down}}))$$

where P_{offset} represents the transmission power offset, duration_2 represents the specific duration, $UTRAN_{\text{up}}$ represents a number of power-up commands among the TPC commands transmitted from the next best cell to the UE, $UTRAN_{\text{down}}$ represents a number of power-down commands among the TPC commands transmitted from the next best cell to the UE, UE_{up} represents a number of power-up commands among the TPC commands transmitted by the current best cell, and UE_{down} represents a number of power-down commands among the TPC commands transmitted by the current best cell.

10

5. The method as claimed in claim 1, wherein the transmission power offset is set to '0' if the TPC command transmitted on a time slot before a point in time where the best cell is changed is a power-down command, and the transmission power offset is set to a preset value if the TPC command transmitted on the time slot before a point in time where the best cell is changed is a power-up command.

6. A method for controlling uplink transmission power in a handover region by a UE (User Equipment) in communication with a Node B using an FCS (Fast Cell Selection) scheme, comprising the steps of:

20 establishing radio links to a plurality of cells in an active set and recognizing that a best cell must be changed from a current best cell to a next best cell according to states of the established radio links, if the UE enters the handover region during communication with the current best cell; and

controlling transmission power according to a TPC (Transmission Power Control) command received from the next best cell for a delay time from a time slot where the UE recognized that the best cell must be changed.

7. The method as claimed in claim 6, wherein the delay time is a time from the time slot where the UE recognized that the best cell must be changed until a time slot where the next best cell first transmits a power-down command as the TPC command.

8. The method as claimed in claim 6, wherein the delay time is a time from the time slot where the UE recognized that the best cell must be changed until a time slot where the best cell is actually changed from the current best cell to the next
5 best cell.

9. The method as claimed in claim 6, further comprising the steps of:
comparing a TPC command received from the current best cell with a TPC
command received from the next best cell for a time duration until a point in time where
10 the UE finally transmits information to the current best cell, during the delay time;
decreasing transmission power if the TPC commands received from the current
best cell and the next best cell are both power-down commands; and
increasing transmission power if any one of the TPC commands received from
the current best cell and the next best cell is a power-up command.

15 10. A method for controlling uplink transmission power in a handover region by a UE (User Equipment) in communication with a Node B using an FCS (Fast Cell Selection) scheme, comprising the steps of:

establishing radio links to a plurality of cells in an active set;
20 recognizing that a best cell must be changed from a current best cell to a next best cell according to states of the established radio links, when the UE enters the handover region during communication with the current best cell;
transmitting a power-down command only when respective states of the radio links for a duration from a point in time where the UE recognized that the best cell must
25 be changed until a point in time where the best cell is actually changed from the current best cell to the next best cell, is larger than or equal to a preset threshold; and
transmitting a power-up command when any one of the radio links has a state value lower than the threshold.

30 11. An apparatus for controlling uplink transmission power in a handover region by a UE (User Equipment) in communication with a Node B using an FCS (Fast Cell Selection) scheme, comprising:

a power measure and best cell identification part for measuring transmission power of a received common pilot channel (CPICH) signal, and creating best cell maintain/change information by determining whether to maintain a current best cell or change the current best cell to a next best cell;

- 5 a demultiplexer for demultiplexing shared control channel (SHCCH) signals received from a plurality of Node Bs in an active set and outputting TPC (Transmission Power Control) commands;

a TPC command memory for storing the TPC commands output from the demultiplexer, received from the plurality of the Node Bs; and

- 10 a UE transmission power controller for determining a transmission power control offset based on TPC commands stored for a specific duration from a point in time where the best cell is changed from the current best cell to the next best cell, upon receipt of best cell change information indicating that the best cell must be changed from the current best cell to the next best cell, output from the power measure and best
15 cell identification part, and then compensating initial transmission power for the next best cell based on the determined power control offset.

10042602-010902